of a light created by an intersection of said light beam with said particles flowing through a particle monitoring region of a light detecting system and proportional to a size of said particles;

amplifying said output by an amplifying means;

conversing an amplified signal to a digital form pulse having an adequate duration with said output;

forming the strobe pulse pack by strobing of said digital form pulse by strobe pulses, and wherein each strobe pulse pack contains at least one of a plurality of a serial sequence of said strobe pulses;

counting a quantity of said strobe pulses within said each strobe pulse pack;

selecting and sorting a plurality of strobe pulse packs by an identical quantity of said strobe pulses within said each strobe pulse pack of said plurality of said strobe pulse packs;

counting a quantity of the identical strobe pulse packs.

39. The method of claim 38, wherein said quantity of said strobe pulses within said each strobe pulse pack contains an information about particle size.

40. The method of claim 38, wherein said quantity of said identical strobe pulse packs contains an information about quantity of the identical size particles.

Remarks

The above new claims 32-40 are substituted as part of the continuation application; these claims (no new matters have been added and these new claims do not raise any issues/disclosures, which are not disclosed in the original/parent application) are substituted to be patentable over the art of record in the parent case for the following reasons:

The objection to the Specification under 37 CFR 1.71 and the claims 26, 28, 30, 31 rejection under 35 U.S.C. 112, first paragraph.

Applicant respectfully traverse this rejection.

The specification, as originally filed, does provide support for the invention as now claimed:
a) the limitation **"terminal means includes at least on of floppy disk means and an external interface means"** is in original disclosure, but erroneously was not printed on page 11 of specification and with the apologize was amended by the Amendment from May 27, 1998 (applicant again apologize, but last line on page 11 does not have continuation on page 12 (the continuation on the first two lines of page 12 **"floppy disk means and an external interface means (all of them not shown). The control subsystem 13 also includes the self-diagnostic and calibration means (not shown), connected to an analog-digital"** had been erroneous not printed), because two last lines on page 12 are erroneously again was printed as the first two lines on page 13.

The limitation **"the quantity of the strobe pulses within ... the identical size particles"** does not introduce new matter in the disclosure, because this limitation clearly follows from Fig.11 (timing diagram "e") and was amended to page 11 as explanation of Fig.11e for more clear understanding.

The limitation **"..., velocity rate, etc."** to page 11 of specification is canceled in its entirety.

The limitation **"said multiplexed bus is divided on a data bus and an address bus, and a digital data exchange is provided by said data bus and said address bus"** does not introduce new matter into the disclosure, because this limitation is clearly disclosed on page 11, line 1, **however:**

This limitation is no longer applied in the new claims 32-40 (see below).

Thus, the applicant has amended the specification and has canceled the claims 26, 28, 30, 31 to overcome the objection under 37 CFR 1.71 and rejection under 35 U.S.C. 112, first paragraph, therefore the rejection under 35 U.S.C. 112, first paragraph, should be withdrawn.

The claims 18, 20, 23 rejection under 35 U.S.C. 112, second paragraph.

Applicant respectfully traverse this rejection.

The above new claims 32-40 eliminate the unclear, confusing, ungrammatical and understood phrases of the claims, such as "a particles" (claims 18 and 23, line 1), "inside which said light beam along a light beam axis" (claim 18, line 4), "detected signals" (claim 18, line 11), "strobe pulse packs" (claim 20). (P.S. The term "pulse pack" is a common technical term, describing the signals containing a plurality of serial sequence of the adequate pulses and is used in the technical literature (for example, in the US Patents No.4,103.234 and 3,723,982).

Thus, the applicant has substituted the claims 18, 20, 23 for the new claims 32, 34, 38 to overcome the rejection under 35 U.S.C. 112, second paragraph, therefore the rejection under 35 U.S.C. 112, second paragraph, should be withdrawn.

The claims 18-28 rejection under 35 U.S.C. 102(e).

Applicant respectfully traverse this rejection.

The PTO declares that "Staff et al. discloses a flow contamination monitor, which comprises a light detecting means (4) for detecting the light from the light source (451) includes a chamber inside which a particle flow (423-427) intersects a light beam in an area of a light detection means, ...".

As is understood from Fig.4A, specification and claims 1, 2, 15, 16, 19, of the referred patent by Staff, the light beam intersects a particle flow (423) in **an optical** sensor assembly 4 (an optical means 4 - see claim 1) in the area of lens (44) between the light source (451) and the mentioned lens (44), and as it can be visually evaluated from Fig.4A the point of intersection of said light

beam with said particle flow is so far from the light detection means (472) area.

Also, a light detection mean (the photodiode 472) "is partially masked by a slit in order that only a selected portion of the light which is passed through the fluid and window, and focused on to the photodiode by a suitable lens." (see claim 2). The lens 4 is also used for magnification of the light passing from the light source through the window and through the fluid (see claim 16).

Therefore, the new claims 32-36, 38-40, wherein the applicant's improved method and device provide elimination of the complexity (the use of the mask, slit, windows, lens and its focusing processes, and the first conduit, second conduit and fluid displacement means - see independent claim 1 of the patent by Staff) of the referred patent by Staff.

The applicant's improved method and device by new claims 32-36, 38-40 provide low power light source and non-optic imaging detection of the light created by flowing particles, that is new, unsuggested and unobvious result.

Regarding Figs.6-8 of the referred patent by Staff and PTO statement that signals detected by the detection means follow "for a detected signal processing to a processing system (figures 6-8)".

This step is inherent to all known (and mostly already patented) particle counters, but it was not a reason for rejection of all of them, because it is just one step pulled out of the entire combination and sequence of the steps, characterizing the method and realizing device.

Regarding claim 19.

The depended claim 5 of Staff et al. is a depended claim of a depended claim 4, which claims that "the duration and extent of light obscuration caused by particles in the fluid" is determined by "measuring **both** the length (duration) and amplitude of signal from the sensor." The amplitude measuring is required because Staff uses an obvious analog method by the amplitude comparison (see comparators 484 on Fig.6, comparators 504, 506 on Fig.7 and comparator 512 on Fig.8).

The claim 19 is no longer applied as a depended claim in the new claims 32-40

Regarding claims 23, 24 and 27.

The "amplifying means (501, 505) and pulse forming means (506) (figure 7) of Staff et al." are not read on the limitations of the applicant's claims 23, 24 and 27, because the element (506) is not a digital pulse forming means and is an analog element - comparator (see Fig.7 of Staff et al.), but the applicant's pulse forming means (24) is a digital pulse forming means as it is described on page 10, lines 18, 19, on page 11, line 1 and as it clearly follows from Fig.11c).

Therefore, the new claim 38, wherein the applicant's improved device provide elimination of the analog comparison elements (comparator 506) of the referred patent by Staff.

The applicant's improved device by new claim 38 provide the digital processing of the amplified signals of the light detection means, that is new, unsuggested and unobvious result.

Regarding claim 25.
The output of the voltage comparator (504), as shown on the Fig.7 of Staff et al., usually is not compatible with the "microprocessor input". On Fig.8 is shown connection of the logic elements (logic gates 516, 517) and counter (518) to a microprocessor, but not the connection of the terminal mens to the microprocessor subsystem.

The multiplexed bus is no longer applied to the new claims 32-40.

Regarding claim 26.
Staff et al is not teaching "that the terminal means is a display (486) and printer (489)". It is known long time before, that the display and printer are the terminal means. Staff et al. teaches that the display (486) and the printer (489) are connected to the switches (490) and (491), which are connected to the counters (485), to the ISO converter (487) and to NAS converter (488) and further to comparators (484), etc., **however:**

The claim 26 is no longer applied in the new claims 32-40.

Regarding claim 28.
The claim 28 does not "raise new matter into the disclosure", because it has described on page 11, line 1 of the applicant's specification, **however:**

The claim 28 is no longer applied in the new claims 32-40.

Thus, the applicant has canceled the claims 19, 26, 28 and substituted the claims 18, 20-24, 25, 27 for the new claims 32-36, 38-40 to overcome the rejection under 35 U.S.C. 102(e), therefore the rejection under 35 U.S.C. 102(e) should be withdrawn.

The claims 29-31 rejection under 35 U.S.C. 103(a).

Applicant respectfully traverse this rejection.

Nakamoto et al. discloses the apparatus and method for analyzing cells, claiming the scattered light collection and comprising a collector lens (7), a dichroic mirror (9), a light shield (8), having a pin hole (16), etc. and, therefore, does not have "all the features of the present invention except for a fiber connecting means for transmitting light from a light source to a detection system; however, such a feature is known in the art, for example as taught by Schmitz et al. (of record)."

The applicant's improved method and device by new claims 32-36 provide the non-optic imaging detection of the particles in contrast to the patent by Nakomoto et al.

The mentioned above PTO statement, however, was not the reason for rejection, for example, of the later patent by Chandler et al. (5,731,875), using the same scattered light collection as Nakomoto et al. and the fiber connecting means as taught by Schmitz et al. (more about patent by Chandler et al. see in the Amendment from November 03, 1998, of the parent case Ser. No.

08/884,680).

Schmitz et al. disclose a fiber optic filter assembly applied for the laser diffraction particle sizing method, comprising the six meter length of the optical fiber cable 36 is wrapped in a coil around the cylindrical tube 44 and two stepper motors 82, intended for dynamical alignment the light beam 56 and also, as shown on Figs.2 and 3, a collimating or beam forming lenses 64 and 66 for light emanating focusing, a cladding layer surrounding a central arc, a Fourier lenses 92, etc. The optical fiber cable wrapped in a coil around the cylindrical tube and the motors for dynamical alignment of the light beam.

The claim 29, wherein the applicant's improved device provide elimination of the complexity disclosed in the patents by Nakomoto et al. and Schmitz et al., providing a new combination of the executive elements (means) as it was described in the claim 29, that is new, unsuggested and unobvious, **however:**

The claim 29 is no longer applied as an independent claim in the new claims 32-40 and substituted for new depended claim 37.

Applicant respectfully requests, if the claims are again rejected upon any combination of references, that the PTO include an explanation, in accordance with M.P.E.P. 706.02, *Ex parte Clapp*, 27 U.S.P.Q. 972 [P.O.B.A 1985], *In re Sernaker*, 217 U.S.P.Q. 1,6 [C.A.F.C. 1983]; *Orthopedic Equipment Co. v. United States*, 217 U.S.P.Q.193, 199 [C.A.F.C. 1983]; *Uniroyal v. Rudkin-Wiley Corp.*, 5 U.S.P.Q.2d 1434 [C.A.F.C. 1988] and *Ex parte Levengood*, 28 U.S.P.Q.2d 1300 [P.T.O.B.A.&I. 1993], supra, a "factual basis to support Examiner's conclusion that it would have been obvious...".

Regarding claim 30.

The claim 30 is no longer applied in the new claims 32-40.

Regarding claim 31.

The claim 31 is no longer applied in the new claims 32-40.

Thus, the applicant has canceled the claims 30, 31 and substituted the independent claim 29 for the new depended claim 37 to overcome the rejection under 35 U.S.C. 103(a), therefore the rejection under 35 U.S.C. 103(a) should be withdrawn.

An improved method and device by applicant's invention, disclosing and claiming a new, previously unrecognized and unobvious step combination (method) and new, previously unrecognized and unobvious combination of the executive means, realizing the new and unobvious method (realizing a new sequence of operations), provide the non-optic imaging detection of the particles by processing only duration (no signal amplitude measurements) of the detected signals and digital processing of the detected signal by strobing of the detected signals by strobe pulses and analyzing of the quantity of the strobe pulses within each strobe pulse pack and the quantity of the

identical strobe pulse packs, that are the **advantages** of the applicant's invention, providing a **commercial success** in the **crowded vessel collision prevention and tactic maneuvering field**.

The referred U.S. Patents are individually complete and functional in itself, so there would be no reason to use portion from or add or substitute portion to any reference in view of each other, considering their different constructive features, instrumental realization and some differences in the methodological approach to the particle counting and measuring problems solving.

CONCLUSION

None of the cited references in the view of the others teaches, mentions or suggests the recitation of the disclosed and claimed **new (unsuggested)** and **unobvious** step combination, as it recited in the applicant's substituted new claims 32-33, 38-40; none of the cited references in the view of the others teaches, mentions or suggests the recitation of the disclosed and claimed **new (unsuggested)** and **unobvious** combination of the executive means, realizing the new and unobvious steps of claims 32-33, as it recited in the applicant's substituted new claim 34-37, providing the non-optic imaging detection of the particles by processing only duration (no signal amplitude measurements) of the detected signals and digital processing of the amplified detected signal by strobing of the detected signals by strobe pulses and analyzing of the quantity of the strobe pulses within each strobe pulse pack and the quantity of the identical strobe pulse packs.

There was no prior art found and referred that suggested modification or combination with the cited art so as to satisfy combination of the present substituted new independent claims 32, 34, 39; especially, the prior art does not teach, mention or suggest:

to provide an intersection of the particles with the light beam at a point within particle monitoring region so that particles are monitored in the chamber, and wherein said intersection is occurred at the point located on the light beam axis and substantially in an area of the light detection means, providing non-optic imaging detecting by said light detection means a light created by said intersection of said light beam with said particles flowing through a particle monitoring region of a light detecting system, and providing an output which is effectively indicative of a duration of said light proportional to a size of said particles,

and

to provide conversing an amplified signal to a digital form pulse having an adequate duration with the light detection means output; to form the strobe pulse pack by strobing of said digital form pulse by strobe pulses, and wherein each strobe pulse pack contains at least one of a plurality of a serial sequence of said strobe pulses; to count a quantity of said strobe pulses within said each strobe pulse pack; to select and sort a plurality of strobe pulse packs by an identical quantity of said strobe pulses within said each strobe pulse pack of said plurality of said strobe pulse packs; to count a quantity of the identical strobe pulse packs hereby providing the information about particle sizes and particle quantity.

Accordingly, the specification has been amended, claims 19, 26, 28, 30, 31 have been canceled

and claims 18, 20-25, 27, 29 substituted for new claims 32-40. (P.S. Regarding new claim 33 see disclosure in the original specification on page 8, line 16-18 and if in view of Examiner the claim 33 is not patentable, the claim 33 can be immediately canceled by applicant - please, in this case contact applicant at telephone number indicated below).

Thus, the objection under 37 CFR 1.71, rejections under 35 U.S.C. 112 first and second paragraphs, under 35 U.S.C. 102(e) and under 35 U.S.C. 103(a) should be withdrawn.

In view of the foregoing amendments, substitutions and accompanying remarks, the rejections of original Claims 18-31 as substituted by new claims 32-40, should be withdrawn.

Applicant as pro-se applicant, respectfully request under M.P.E.P. 707.07(j), that if the Examiner feels that applicant's present claims are not entirely suitable, the Examiner drafts one or more allowable claims for applicant.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact applicant, at the telephone number indicated below, to arrange for an interview to expedite the disposition of this case.

For all the reasons given above, applicant respectfully submits that the errors in the specification are corrected and the claims comply with Sections 102, 103 and 112. Accordingly, applicant submits that this application is now in full condition for allowance, which action applicant respectfully solicits.

Very respectfully,

ALEKSANDR L. YUFA, Ph.D. May 13, 1999

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I hereby certify that this paper and fee is being deposited with the United States Postal Service using "Express Mail # EJ 493306202 US Post Office To Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to "Assistant Commissioner for Patents, Washington, DC 20231."

Date: May 13, 1999 Applicant: Aleksandr L. Yufa, Ph.D.